PATENT COOPERATION TREATY

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	5 April 2005 (05.04.2005)
Applicant's or agent's file reference: LW9107PC	**FOR FURTHER ACTION** See paragraph 2 below
International application No.: PCT/KR 2004/003429	International filing date *(day/month/year)*: 24 December 2004 (24.12.2004)
	Priority Date *(day/month/year)*: 8 January 2004 (08.01.2004)
International Patent Classification (IPC) or both national classification and IPC: H01J 65/04, H01J 61/30, G02F 1/13357	
Applicant: SAMSUNG ELECTRO-MECHANICS CO., LTD	

1. This opinion contains indications relating to the following items:

- [x] Cont. No. I — Basis of the opinion
- [ ] Cont. No. II — Priority
- [ ] Cont. No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Cont. No. IV — Lack of unity of invention
- [x] Cont. No. V — Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Cont. No. VI — Certain documents cited
- [ ] Cont. No. VII — Certain defects in the international application
- [ ] Cont. No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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International application No.
PCT/KR 2004/003429

Continuation No. I

Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of

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Continuation No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims **1-27**	**YES**
	Claims **----**	**NO**
Inventive step (IS)	Claims **1-27**	**YES**
	Claims **----**	**NO**
Industrial applicability (IA)	Claims **1-27**	**YES**
	Claims **----**	**NO**

2. Citations and explanations:

The following documents are cited in the search report:

D1 EP 1 122 759 A2
D2 KR 2003081866 A (abstract)
D3 US 2002/0105259 A1
D4 US 2003/0132711 A1

D1 relates to a secondary amplification structure employing carbon nanotubes incorporated in a plasma panel and a back light using the same. The panel comprises first and second substrates and a gas discharge space formed between the substrates and a sealant. In an first embodiment, an electrode is formed on the inner side of the first substrate and a carbon nanotube (CNT) layer and a layer consisting of a metal oxide are formed on the electrode (Fig.9,10). A luminescent material layer is formed on the inner surface of the second substrate and on side surfaces of partition members. The metal oxide layer cooperates with the carbon nanutobe layer in forming a secondary electron amplification structure. As an alternative, the luminescent material layer may be formed on the inner surface of the first substrate and disposed on the electrode, and the CNT layer together with the metal oxide layer is formed on the inner side of the second substrate (Fig.11,12). A second CNT layer may be incorporated in the luminescent layer disposed on the first substrate (Fig.12).

Subject matter of independent claims 1 and 22 of the present application differs from the disclosure of D1 in that an electrode is formed on an outer surface of the first substrate and in that the position of the discharge auxiliary layer corresponds to a position of the electrode. These differing features are also not made obvious by D1. Further, D1 does not describe a

liquid crystal display apparatus having a LCD panel and a receiving container that receives the surface light source and the LCD panel (to claim 22).

Subject matter of independent claims 14 and 26 of the application differs from the disclosure of D1 in that an electrode is formed on the outer surface of the first substrate and in that a single discharge fluorescent layer comprising carbon nanotubes, an oxide and a fluorescent material is formed on an inner surface of the first substrate. These differing features are also not made obvious by D1.

D2 relates to flat back light unit for a LCD where an upper substrate is coated with an electrode film and a fluorescent layer is formed on the electrode film. A thin film conductive layer is coated on a lower substrate and a metal thin film is formed on this conductive layer. A carbon nanotube layer with fine metal grains filled in between the nanotubes is formed on the metal thin film. A spacer is arranged between the upper and lower substrate.

As in the case of D1, an arrangement where an electrode is formed on an outer surface of the upper substrate and a discharge auxiliary layer is formed on an inner surface of the first substrate in a corresponding position of the electrode (claim1 and 14), and an arrangement where a single discharge fluorescent layer comprising carbon nanotubes, an oxide and a fluorescent material (claim 14 and 22) are not disclosed in D2. These features are also not made obvious by D2.

Fig. 9C and 9D of D3, which also relates to a flat discharge lamp, show an arrangement in which electrodes are formed on outer surfaces of first and second substrates made of glass. This has the advantage that the substrates may be used as a dielectric. In the embodiment shown in Fig. 2, an electrode substrate having an electrode, a dielectric layer and a protective layer made of MgO is formed on both outer sidewalls of the lamp apparatus. The protective layer is intended to reduce a discharge voltage. A fluorescent layer having a discharge auxiliary layer or a discharge fluorescent layer comprising carbon nanotubes, an oxide and a fluorescent material are not disclosed in D3. Hence, the subject matter of independent claims 1, 14, 22 and 26 is considered novel and inventive with regard to D3.

D4 relates to surface light sources for LCD devices which are of the prior art type mentioned in the introductory part of the application. First and second substrates together with a sealant form a discharge space. A fluorescent layer is coated on the inner side of the first substrate and a cathode and an anode electrode, covered with an insulating layer, are formed on the inner side of the second substrate. The fluorescent layer may include a metal oxide to increase secondary electron emission. Fig. 7 shows a LCD device consisting of the surface light source and a LCD panel both received within a receiving container.

The dependent claims characterize specified embodiments of the subject matter of independent claims 1, 14, 22 and 26 and are considered novel and including an inventive step in combination with the independent claims to which they refer back.

According to what is set out above, the requirements of novelty and inventive step are complied with for all claims of the application.